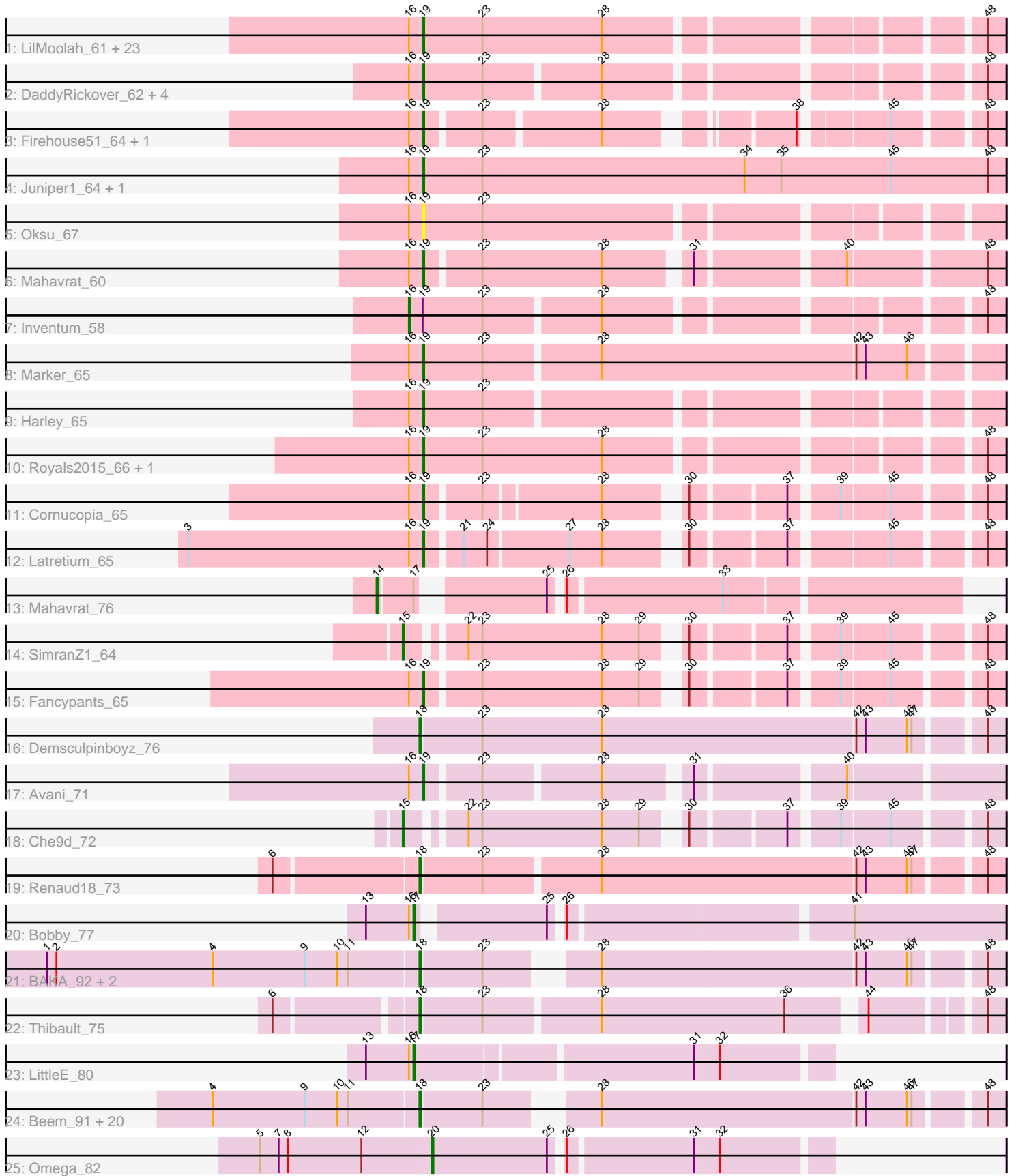


Pham 171411



Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly with annotated starts, the track will be further scaled to only show that region of the ORF with annotated starts. This action will be indicated by adding "Zoomed" to the title. For starts, yellow indicates the location of called starts comprised solely of Glimmer/GeneMark auto-annotations, green indicates the location of called starts with at least 1 manual gene annotation.

## Pham 171411 Report

This analysis was run 07/10/24 on database version 566.

Pham number 171411 has 77 members, 7 are drafts.

Phages represented in each track:

- Track 1 : LilMoolah\_61, Che8\_68, Job42\_65, Cerasum\_59, James\_67, Eradicator\_56, Mattes\_67, BuzzLyseyear\_69, Lizziana\_69, BigPhil\_59, Nivrat\_59, Velveteen\_58, GUmbe\_61, Guppsters\_63, Coco12\_62, Philus\_66, Saal\_65, DRBy19\_66, Yorick\_62, Kingsley\_60, IbOuu\_64, Gorge\_67, OlympiaSaint\_65, Sarma624\_61
- Track 2 : DaddyRickover\_62, Dorothy\_61, Sassafras\_61, Aubs\_63, RedBird\_61
- Track 3 : Firehouse51\_64, Mutaforma13\_67
- Track 4 : Juniper1\_64, Estave1\_66
- Track 5 : Oksu\_67
- Track 6 : Mahavrat\_60
- Track 7 : Inventum\_58
- Track 8 : Marker\_65
- Track 9 : Harley\_65
- Track 10 : Royals2015\_66, Pollywog\_64
- Track 11 : Cornucopia\_65
- Track 12 : Latretium\_65
- Track 13 : Mahavrat\_76
- Track 14 : SimranZ1\_64
- Track 15 : Fancypants\_65
- Track 16 : Demsculpinboyz\_76
- Track 17 : Avani\_71
- Track 18 : Che9d\_72
- Track 19 : Renaud18\_73
- Track 20 : Bobby\_77
- Track 21 : BAKA\_92, Optimus\_85, EricMillard\_84
- Track 22 : Thibault\_75
- Track 23 : LittleE\_80
- Track 24 : Beem\_91, Bagrid\_90, DmpstrDiver\_91, HokkenD\_80, Halley\_92, Bombitas\_79, Klein\_91, Yeet\_84, Kalah2\_85, Dove\_78, Wanda\_95, Zelink\_88, Schatzie\_86, ThreeRngTarjay\_88, Constella\_76, JuicyJay\_88, NihilNomen\_92, Odette\_89, Phoebus\_93, Hughesyang\_91, Minerva\_90
- Track 25 : Omega\_82

**Summary of Final Annotations (See graph section above for start numbers):**

The start number called the most often in the published annotations is 19, it was called in 39 of the 70 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aubs\_63, Avani\_71, BigPhil\_59, BuzzLyseyear\_69, Cerasum\_59, Che8\_68, Coco12\_62, Cornucopia\_65, DRBy19\_66, DaddyRickover\_62, Dorothy\_61, Eradicator\_56, Estave1\_66, Fancypants\_65, Firehouse51\_64, GUmbie\_61, Gorge\_67, Guppsters\_63, Harley\_65, IbOuu\_64, James\_67, Job42\_65, Juniper1\_64, Kingsley\_60, Latretium\_65, LilMoolah\_61, Lizziana\_69, Mahavrat\_60, Marker\_65, Mattes\_67, Mutaforma13\_67, Nivrat\_59, Oksu\_67, OlympiaSaint\_65, Philus\_66, Pollywog\_64, RedBird\_61, Royals2015\_66, Saal\_65, Sarma624\_61, Sassafras\_61, Velveteen\_58, Yorick\_62,

Genes that have the "Most Annotated" start but do not call it:

- Inventum\_58,

Genes that do not have the "Most Annotated" start:

- BAKA\_92, Bagrid\_90, Beem\_91, Bobby\_77, Bombitas\_79, Che9d\_72, Constella\_76, Demsculpinboyz\_76, DmpstrDiver\_91, Dove\_78, EricMillard\_84, Halley\_92, HokkenD\_80, Hughesyang\_91, JuicyJay\_88, Kalah2\_85, Klein\_91, LittleE\_80, Mahavrat\_76, Minerva\_90, NihilNomen\_92, Odette\_89, Omega\_82, Optimus\_85, Phoebus\_93, Renaud18\_73, Schatzie\_86, SimranZ1\_64, Thibault\_75, ThreeRngTarjay\_88, Wanda\_95, Yeet\_84, Zelink\_88,

### Summary by start number:

Start 14:

- Found in 1 of 77 ( 1.3% ) of genes in pham
- Manual Annotations of this start: 1 of 70
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Mahavrat\_76 (F1),

Start 15:

- Found in 2 of 77 ( 2.6% ) of genes in pham
- Manual Annotations of this start: 2 of 70
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Che9d\_72 (F2), SimranZ1\_64 (F1),

Start 16:

- Found in 46 of 77 ( 59.7% ) of genes in pham
- Manual Annotations of this start: 1 of 70
- Called 2.2% of time when present
- Phage (with cluster) where this start called: Inventum\_58 (F1),

Start 17:

- Found in 3 of 77 ( 3.9% ) of genes in pham
- Manual Annotations of this start: 2 of 70
- Called 66.7% of time when present
- Phage (with cluster) where this start called: Bobby\_77 (J), LittleE\_80 (J),

Start 18:

- Found in 27 of 77 ( 35.1% ) of genes in pham

- Manual Annotations of this start: 24 of 70
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BAKA\_92 (J), Bagrid\_90 (J), Beem\_91 (J), Bombitas\_79 (J), Constella\_76 (J), Demsculpinboyz\_76 (F2), DmpstrDiver\_91 (J), Dove\_78 (J), EricMillard\_84 (J), Halley\_92 (J), HokkenD\_80 (J), Hughesyang\_91 (J), JuicyJay\_88 (J), Kalah2\_85 (J), Klein\_91 (J), Minerva\_90 (J), NihilNomen\_92 (J), Odette\_89 (J), Optimus\_85 (J), Phoebus\_93 (J), Renaud18\_73 (F4), Schatzie\_86 (J), Thibault\_75 (J), ThreeRngTarjay\_88 (J), Wanda\_95 (J), Yeet\_84 (J), Zelink\_88 (J),

Start 19:

- Found in 44 of 77 ( 57.1% ) of genes in pham
- Manual Annotations of this start: 39 of 70
- Called 97.7% of time when present
- Phage (with cluster) where this start called: Aubs\_63 (F1), Avani\_71 (F2), BigPhil\_59 (F1), BuzzLyseyear\_69 (F1), Cerasum\_59 (F1), Che8\_68 (F1), Coco12\_62 (F1), Cornucopia\_65 (F1), DRBy19\_66 (F1), DaddyRickover\_62 (F1), Dorothy\_61 (F1), Eradicator\_56 (F1), Estave1\_66 (F1), Fancypants\_65 (F1), Firehouse51\_64 (F1), GUmbie\_61 (F1), Gorge\_67 (F1), Guppsters\_63 (F1), Harley\_65 (F1), IbOuu\_64 (F1), James\_67 (F1), Job42\_65 (F1), Juniper1\_64 (F1), Kingsley\_60 (F1), Latretium\_65 (F1), LilMoolah\_61 (F1), Lizziana\_69 (F1), Mahavrat\_60 (F1), Marker\_65 (F1), Mattes\_67 (F1), Mutaforma13\_67 (F1), Nivrat\_59 (F1), Oksu\_67 (F1), OlympiaSaint\_65 (F1), Philus\_66 (F1), Pollywog\_64 (F1), RedBird\_61 (F1), Royals2015\_66 (F1), Saal\_65 (F1), Sarma624\_61 (F1), Sassafras\_61 (F1), Velveteen\_58 (F1), Yorick\_62 (F1),

Start 20:

- Found in 1 of 77 ( 1.3% ) of genes in pham
- Manual Annotations of this start: 1 of 70
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Omega\_82 (J),

### Summary by clusters:

There are 4 clusters represented in this pham: F1, F2, J, F4,

Info for manual annotations of cluster F1:

- Start number 14 was manually annotated 1 time for cluster F1.
- Start number 15 was manually annotated 1 time for cluster F1.
- Start number 16 was manually annotated 1 time for cluster F1.
- Start number 19 was manually annotated 38 times for cluster F1.

Info for manual annotations of cluster F2:

- Start number 15 was manually annotated 1 time for cluster F2.
- Start number 18 was manually annotated 1 time for cluster F2.
- Start number 19 was manually annotated 1 time for cluster F2.

Info for manual annotations of cluster F4:

- Start number 18 was manually annotated 1 time for cluster F4.

Info for manual annotations of cluster J:

- Start number 17 was manually annotated 2 times for cluster J.
- Start number 18 was manually annotated 22 times for cluster J.
- Start number 20 was manually annotated 1 time for cluster J.

**Gene Information:**

Gene: Aubs\_63 Start: 41384, Stop: 41719, Start Num: 19

Candidate Starts for Aubs\_63:

(Start: 16 @41375 has 1 MA's), (Start: 19 @41384 has 39 MA's), (23, 41423), (28, 41495), (48, 41708),

Gene: Avani\_71 Start: 41759, Stop: 42094, Start Num: 19

Candidate Starts for Avani\_71:

(Start: 16 @41750 has 1 MA's), (Start: 19 @41759 has 39 MA's), (23, 41792), (28, 41864), (31, 41912), (40, 41999),

Gene: BAKA\_92 Start: 57196, Stop: 57537, Start Num: 18

Candidate Starts for BAKA\_92:

(1, 56956), (2, 56962), (4, 57064), (9, 57124), (10, 57145), (11, 57151), (Start: 18 @57196 has 24 MA's), (23, 57235), (28, 57289), (42, 57451), (43, 57457), (46, 57484), (47, 57487), (48, 57526),

Gene: Bagrid\_90 Start: 56063, Stop: 56404, Start Num: 18

Candidate Starts for Bagrid\_90:

(4, 55931), (9, 55991), (10, 56012), (11, 56018), (Start: 18 @56063 has 24 MA's), (23, 56102), (28, 56156), (42, 56318), (43, 56324), (46, 56351), (47, 56354), (48, 56393),

Gene: Beem\_91 Start: 56924, Stop: 57265, Start Num: 18

Candidate Starts for Beem\_91:

(4, 56792), (9, 56852), (10, 56873), (11, 56879), (Start: 18 @56924 has 24 MA's), (23, 56963), (28, 57017), (42, 57179), (43, 57185), (46, 57212), (47, 57215), (48, 57254),

Gene: BigPhil\_59 Start: 37375, Stop: 37716, Start Num: 19

Candidate Starts for BigPhil\_59:

(Start: 16 @37366 has 1 MA's), (Start: 19 @37375 has 39 MA's), (23, 37414), (28, 37492), (48, 37705),

Gene: Bobby\_77 Start: 51896, Stop: 51546, Start Num: 17

Candidate Starts for Bobby\_77:

(13, 51926), (Start: 16 @51899 has 1 MA's), (Start: 17 @51896 has 2 MA's), (25, 51821), (26, 51815), (41, 51644),

Gene: Bombitas\_79 Start: 54087, Stop: 54428, Start Num: 18

Candidate Starts for Bombitas\_79:

(4, 53955), (9, 54015), (10, 54036), (11, 54042), (Start: 18 @54087 has 24 MA's), (23, 54126), (28, 54180), (42, 54342), (43, 54348), (46, 54375), (47, 54378), (48, 54417),

Gene: BuzzLyseyear\_69 Start: 42383, Stop: 42724, Start Num: 19

Candidate Starts for BuzzLyseyear\_69:

(Start: 16 @42374 has 1 MA's), (Start: 19 @42383 has 39 MA's), (23, 42422), (28, 42500), (48, 42713),

Gene: Cerasum\_59 Start: 37393, Stop: 37734, Start Num: 19

Candidate Starts for Cerasum\_59:

(Start: 16 @37384 has 1 MA's), (Start: 19 @37393 has 39 MA's), (23, 37432), (28, 37510), (48, 37723),

Gene: Che8\_68 Start: 43879, Stop: 44220, Start Num: 19

Candidate Starts for Che8\_68:

(Start: 16 @43870 has 1 MA's), (Start: 19 @43879 has 39 MA's), (23, 43918), (28, 43996), (48, 44209),

Gene: Che9d\_72 Start: 41100, Stop: 41432, Start Num: 15

Candidate Starts for Che9d\_72:

(Start: 15 @41100 has 2 MA's), (22, 41130), (23, 41139), (28, 41217), (29, 41241), (30, 41259), (37, 41313), (39, 41340), (45, 41370), (48, 41421),

Gene: Coco12\_62 Start: 41450, Stop: 41791, Start Num: 19

Candidate Starts for Coco12\_62:

(Start: 16 @41441 has 1 MA's), (Start: 19 @41450 has 39 MA's), (23, 41489), (28, 41567), (48, 41780),

Gene: Constella\_76 Start: 51061, Stop: 51402, Start Num: 18

Candidate Starts for Constella\_76:

(4, 50929), (9, 50989), (10, 51010), (11, 51016), (Start: 18 @51061 has 24 MA's), (23, 51100), (28, 51154), (42, 51316), (43, 51322), (46, 51349), (47, 51352), (48, 51391),

Gene: Cornucopia\_65 Start: 41687, Stop: 42007, Start Num: 19

Candidate Starts for Cornucopia\_65:

(Start: 16 @41678 has 1 MA's), (Start: 19 @41687 has 39 MA's), (23, 41720), (28, 41792), (30, 41834), (37, 41888), (39, 41915), (45, 41945), (48, 41996),

Gene: DRBy19\_66 Start: 42134, Stop: 42475, Start Num: 19

Candidate Starts for DRBy19\_66:

(Start: 16 @42125 has 1 MA's), (Start: 19 @42134 has 39 MA's), (23, 42173), (28, 42251), (48, 42464),

Gene: DaddyRickover\_62 Start: 41176, Stop: 41511, Start Num: 19

Candidate Starts for DaddyRickover\_62:

(Start: 16 @41167 has 1 MA's), (Start: 19 @41176 has 39 MA's), (23, 41215), (28, 41287), (48, 41500),

Gene: Demsculpinboyz\_76 Start: 41371, Stop: 41736, Start Num: 18

Candidate Starts for Demsculpinboyz\_76:

(Start: 18 @41371 has 24 MA's), (23, 41410), (28, 41488), (42, 41650), (43, 41656), (46, 41683), (47, 41686), (48, 41725),

Gene: DmpstrDiver\_91 Start: 56259, Stop: 56600, Start Num: 18

Candidate Starts for DmpstrDiver\_91:

(4, 56127), (9, 56187), (10, 56208), (11, 56214), (Start: 18 @56259 has 24 MA's), (23, 56298), (28, 56352), (42, 56514), (43, 56520), (46, 56547), (47, 56550), (48, 56589),

Gene: Dorothy\_61 Start: 40350, Stop: 40685, Start Num: 19

Candidate Starts for Dorothy\_61:

(Start: 16 @40341 has 1 MA's), (Start: 19 @40350 has 39 MA's), (23, 40389), (28, 40461), (48, 40674),

Gene: Dove\_78 Start: 52353, Stop: 52694, Start Num: 18

Candidate Starts for Dove\_78:

(4, 52221), (9, 52281), (10, 52302), (11, 52308), (Start: 18 @52353 has 24 MA's), (23, 52392), (28, 52446), (42, 52608), (43, 52614), (46, 52641), (47, 52644), (48, 52683),

Gene: Eradicator\_56 Start: 39233, Stop: 39574, Start Num: 19

Candidate Starts for Eradicator\_56:

(Start: 16 @39224 has 1 MA's), (Start: 19 @39233 has 39 MA's), (23, 39272), (28, 39350), (48, 39563),

Gene: EricMillard\_84 Start: 55991, Stop: 56332, Start Num: 18

Candidate Starts for EricMillard\_84:

(1, 55751), (2, 55757), (4, 55859), (9, 55919), (10, 55940), (11, 55946), (Start: 18 @55991 has 24 MA's), (23, 56030), (28, 56084), (42, 56246), (43, 56252), (46, 56279), (47, 56282), (48, 56321),

Gene: Estave1\_66 Start: 42262, Stop: 42642, Start Num: 19

Candidate Starts for Estave1\_66:

(Start: 16 @42253 has 1 MA's), (Start: 19 @42262 has 39 MA's), (23, 42301), (34, 42472), (35, 42496), (45, 42568), (48, 42631),

Gene: Fancypants\_65 Start: 41674, Stop: 42000, Start Num: 19

Candidate Starts for Fancypants\_65:

(Start: 16 @41665 has 1 MA's), (Start: 19 @41674 has 39 MA's), (23, 41707), (28, 41785), (29, 41809), (30, 41827), (37, 41881), (39, 41908), (45, 41938), (48, 41989),

Gene: Firehouse51\_64 Start: 44558, Stop: 44872, Start Num: 19

Candidate Starts for Firehouse51\_64:

(Start: 16 @44549 has 1 MA's), (Start: 19 @44558 has 39 MA's), (23, 44591), (28, 44663), (38, 44762), (45, 44810), (48, 44861),

Gene: GUmbie\_61 Start: 40460, Stop: 40801, Start Num: 19

Candidate Starts for GUmbie\_61:

(Start: 16 @40451 has 1 MA's), (Start: 19 @40460 has 39 MA's), (23, 40499), (28, 40577), (48, 40790),

Gene: Gorge\_67 Start: 42402, Stop: 42743, Start Num: 19

Candidate Starts for Gorge\_67:

(Start: 16 @42393 has 1 MA's), (Start: 19 @42402 has 39 MA's), (23, 42441), (28, 42519), (48, 42732),

Gene: Guppsters\_63 Start: 40585, Stop: 40926, Start Num: 19

Candidate Starts for Guppsters\_63:

(Start: 16 @40576 has 1 MA's), (Start: 19 @40585 has 39 MA's), (23, 40624), (28, 40702), (48, 40915),

Gene: Halley\_92 Start: 56924, Stop: 57265, Start Num: 18

Candidate Starts for Halley\_92:

(4, 56792), (9, 56852), (10, 56873), (11, 56879), (Start: 18 @56924 has 24 MA's), (23, 56963), (28, 57017), (42, 57179), (43, 57185), (46, 57212), (47, 57215), (48, 57254),

Gene: Harley\_65 Start: 42034, Stop: 42369, Start Num: 19

Candidate Starts for Harley\_65:

(Start: 16 @42025 has 1 MA's), (Start: 19 @42034 has 39 MA's), (23, 42073),

Gene: HokkenD\_80 Start: 55193, Stop: 55534, Start Num: 18

Candidate Starts for HokkenD\_80:

(4, 55061), (9, 55121), (10, 55142), (11, 55148), (Start: 18 @55193 has 24 MA's), (23, 55232), (28, 55286), (42, 55448), (43, 55454), (46, 55481), (47, 55484), (48, 55523),

Gene: Hughesyang\_91 Start: 56882, Stop: 57223, Start Num: 18

Candidate Starts for Hughesyang\_91:

(4, 56750), (9, 56810), (10, 56831), (11, 56837), (Start: 18 @56882 has 24 MA's), (23, 56921), (28, 56975), (42, 57137), (43, 57143), (46, 57170), (47, 57173), (48, 57212),

Gene: lbOuu\_64 Start: 41437, Stop: 41772, Start Num: 19

Candidate Starts for lbOuu\_64:

(Start: 16 @41428 has 1 MA's), (Start: 19 @41437 has 39 MA's), (23, 41476), (28, 41548), (48, 41761),

Gene: Inventum\_58 Start: 40539, Stop: 40883, Start Num: 16

Candidate Starts for Inventum\_58:

(Start: 16 @40539 has 1 MA's), (Start: 19 @40548 has 39 MA's), (23, 40587), (28, 40659), (48, 40872),

Gene: James\_67 Start: 42527, Stop: 42868, Start Num: 19

Candidate Starts for James\_67:

(Start: 16 @42518 has 1 MA's), (Start: 19 @42527 has 39 MA's), (23, 42566), (28, 42644), (48, 42857),

Gene: Job42\_65 Start: 42942, Stop: 43283, Start Num: 19

Candidate Starts for Job42\_65:

(Start: 16 @42933 has 1 MA's), (Start: 19 @42942 has 39 MA's), (23, 42981), (28, 43059), (48, 43272),

Gene: JuicyJay\_88 Start: 58058, Stop: 58399, Start Num: 18

Candidate Starts for JuicyJay\_88:

(4, 57926), (9, 57986), (10, 58007), (11, 58013), (Start: 18 @58058 has 24 MA's), (23, 58097), (28, 58151), (42, 58313), (43, 58319), (46, 58346), (47, 58349), (48, 58388),

Gene: Juniper1\_64 Start: 41298, Stop: 41678, Start Num: 19

Candidate Starts for Juniper1\_64:

(Start: 16 @41289 has 1 MA's), (Start: 19 @41298 has 39 MA's), (23, 41337), (34, 41508), (35, 41532), (45, 41604), (48, 41667),

Gene: Kalah2\_85 Start: 56217, Stop: 56558, Start Num: 18

Candidate Starts for Kalah2\_85:

(4, 56085), (9, 56145), (10, 56166), (11, 56172), (Start: 18 @56217 has 24 MA's), (23, 56256), (28, 56310), (42, 56472), (43, 56478), (46, 56505), (47, 56508), (48, 56547),

Gene: Kingsley\_60 Start: 40183, Stop: 40524, Start Num: 19

Candidate Starts for Kingsley\_60:

(Start: 16 @40174 has 1 MA's), (Start: 19 @40183 has 39 MA's), (23, 40222), (28, 40300), (48, 40513),

Gene: Klein\_91 Start: 55893, Stop: 56234, Start Num: 18

Candidate Starts for Klein\_91:



(4, 55761), (9, 55821), (10, 55842), (11, 55848), (Start: 18 @55893 has 24 MA's), (23, 55932), (28, 55986), (42, 56148), (43, 56154), (46, 56181), (47, 56184), (48, 56223),

Gene: Latretium\_65 Start: 41581, Stop: 41904, Start Num: 19

Candidate Starts for Latretium\_65:

(3, 41428), (Start: 16 @41572 has 1 MA's), (Start: 19 @41581 has 39 MA's), (21, 41602), (24, 41617), (27, 41668), (28, 41689), (30, 41731), (37, 41785), (45, 41842), (48, 41893),

Gene: LilMoolah\_61 Start: 40447, Stop: 40788, Start Num: 19

Candidate Starts for LilMoolah\_61:

(Start: 16 @40438 has 1 MA's), (Start: 19 @40447 has 39 MA's), (23, 40486), (28, 40564), (48, 40777),

Gene: LittleE\_80 Start: 51274, Stop: 51020, Start Num: 17

Candidate Starts for LittleE\_80:

(13, 51304), (Start: 16 @51277 has 1 MA's), (Start: 17 @51274 has 2 MA's), (31, 51103), (32, 51088),

Gene: Lizziana\_69 Start: 42008, Stop: 42349, Start Num: 19

Candidate Starts for Lizziana\_69:

(Start: 16 @41999 has 1 MA's), (Start: 19 @42008 has 39 MA's), (23, 42047), (28, 42125), (48, 42338),

Gene: Mahavrat\_60 Start: 40518, Stop: 40859, Start Num: 19

Candidate Starts for Mahavrat\_60:

(Start: 16 @40509 has 1 MA's), (Start: 19 @40518 has 39 MA's), (23, 40551), (28, 40629), (31, 40677), (40, 40764), (48, 40848),

Gene: Mahavrat\_76 Start: 46252, Stop: 46590, Start Num: 14

Candidate Starts for Mahavrat\_76:

(Start: 14 @46252 has 1 MA's), (Start: 17 @46273 has 2 MA's), (25, 46342), (26, 46348), (33, 46444),

Gene: Marker\_65 Start: 41128, Stop: 41487, Start Num: 19

Candidate Starts for Marker\_65:

(Start: 16 @41119 has 1 MA's), (Start: 19 @41128 has 39 MA's), (23, 41167), (28, 41239), (42, 41401), (43, 41407), (46, 41434),

Gene: Mattes\_67 Start: 42527, Stop: 42868, Start Num: 19

Candidate Starts for Mattes\_67:

(Start: 16 @42518 has 1 MA's), (Start: 19 @42527 has 39 MA's), (23, 42566), (28, 42644), (48, 42857),

Gene: Minerva\_90 Start: 56841, Stop: 57182, Start Num: 18

Candidate Starts for Minerva\_90:

(4, 56709), (9, 56769), (10, 56790), (11, 56796), (Start: 18 @56841 has 24 MA's), (23, 56880), (28, 56934), (42, 57096), (43, 57102), (46, 57129), (47, 57132), (48, 57171),

Gene: Mutaforma13\_67 Start: 43868, Stop: 44182, Start Num: 19

Candidate Starts for Mutaforma13\_67:

(Start: 16 @43859 has 1 MA's), (Start: 19 @43868 has 39 MA's), (23, 43901), (28, 43973), (38, 44072), (45, 44120), (48, 44171),

Gene: NihilNomen\_92 Start: 57011, Stop: 57352, Start Num: 18

Candidate Starts for NihilNomen\_92:

(4, 56879), (9, 56939), (10, 56960), (11, 56966), (Start: 18 @57011 has 24 MA's), (23, 57050), (28, 57104), (42, 57266), (43, 57272), (46, 57299), (47, 57302), (48, 57341),

Gene: Nivrat\_59 Start: 40320, Stop: 40661, Start Num: 19

Candidate Starts for Nivrat\_59:

(Start: 16 @40311 has 1 MA's), (Start: 19 @40320 has 39 MA's), (23, 40359), (28, 40437), (48, 40650),

Gene: Odette\_89 Start: 56053, Stop: 56394, Start Num: 18

Candidate Starts for Odette\_89:

(4, 55921), (9, 55981), (10, 56002), (11, 56008), (Start: 18 @56053 has 24 MA's), (23, 56092), (28, 56146), (42, 56308), (43, 56314), (46, 56341), (47, 56344), (48, 56383),

Gene: Oksu\_67 Start: 43933, Stop: 44274, Start Num: 19

Candidate Starts for Oksu\_67:

(Start: 16 @43924 has 1 MA's), (Start: 19 @43933 has 39 MA's), (23, 43972),

Gene: OlympiaSaint\_65 Start: 41469, Stop: 41810, Start Num: 19

Candidate Starts for OlympiaSaint\_65:

(Start: 16 @41460 has 1 MA's), (Start: 19 @41469 has 39 MA's), (23, 41508), (28, 41586), (48, 41799),

Gene: Omega\_82 Start: 52706, Stop: 52464, Start Num: 20

Candidate Starts for Omega\_82:

(5, 52817), (7, 52805), (8, 52799), (12, 52751), (Start: 20 @52706 has 1 MA's), (25, 52631), (26, 52625), (31, 52547), (32, 52532),

Gene: Optimus\_85 Start: 55545, Stop: 55886, Start Num: 18

Candidate Starts for Optimus\_85:

(1, 55305), (2, 55311), (4, 55413), (9, 55473), (10, 55494), (11, 55500), (Start: 18 @55545 has 24 MA's), (23, 55584), (28, 55638), (42, 55800), (43, 55806), (46, 55833), (47, 55836), (48, 55875),

Gene: Philus\_66 Start: 42110, Stop: 42451, Start Num: 19

Candidate Starts for Philus\_66:

(Start: 16 @42101 has 1 MA's), (Start: 19 @42110 has 39 MA's), (23, 42149), (28, 42227), (48, 42440),

Gene: Phoebus\_93 Start: 58193, Stop: 58534, Start Num: 18

Candidate Starts for Phoebus\_93:

(4, 58061), (9, 58121), (10, 58142), (11, 58148), (Start: 18 @58193 has 24 MA's), (23, 58232), (28, 58286), (42, 58448), (43, 58454), (46, 58481), (47, 58484), (48, 58523),

Gene: Pollywog\_64 Start: 41787, Stop: 42128, Start Num: 19

Candidate Starts for Pollywog\_64:

(Start: 16 @41778 has 1 MA's), (Start: 19 @41787 has 39 MA's), (23, 41826), (28, 41904), (48, 42117),

Gene: RedBird\_61 Start: 40229, Stop: 40564, Start Num: 19

Candidate Starts for RedBird\_61:

(Start: 16 @40220 has 1 MA's), (Start: 19 @40229 has 39 MA's), (23, 40268), (28, 40340), (48, 40553),

Gene: Renaud18\_73 Start: 42883, Stop: 43242, Start Num: 18

Candidate Starts for Renaud18\_73:

(6, 42793), (Start: 18 @42883 has 24 MA's), (23, 42922), (28, 42994), (42, 43156), (43, 43162), (46, 43189), (47, 43192), (48, 43231),

Gene: Royals2015\_66 Start: 41205, Stop: 41546, Start Num: 19

Candidate Starts for Royals2015\_66:

(Start: 16 @41196 has 1 MA's), (Start: 19 @41205 has 39 MA's), (23, 41244), (28, 41322), (48, 41535),

Gene: Saal\_65 Start: 42221, Stop: 42562, Start Num: 19

Candidate Starts for Saal\_65:

(Start: 16 @42212 has 1 MA's), (Start: 19 @42221 has 39 MA's), (23, 42260), (28, 42338), (48, 42551),

Gene: Sarma624\_61 Start: 37375, Stop: 37716, Start Num: 19

Candidate Starts for Sarma624\_61:

(Start: 16 @37366 has 1 MA's), (Start: 19 @37375 has 39 MA's), (23, 37414), (28, 37492), (48, 37705),

Gene: Sassafras\_61 Start: 40547, Stop: 40882, Start Num: 19

Candidate Starts for Sassafras\_61:

(Start: 16 @40538 has 1 MA's), (Start: 19 @40547 has 39 MA's), (23, 40586), (28, 40658), (48, 40871),

Gene: Schatzie\_86 Start: 55800, Stop: 56141, Start Num: 18

Candidate Starts for Schatzie\_86:

(4, 55668), (9, 55728), (10, 55749), (11, 55755), (Start: 18 @55800 has 24 MA's), (23, 55839), (28, 55893), (42, 56055), (43, 56061), (46, 56088), (47, 56091), (48, 56130),

Gene: SimranZ1\_64 Start: 41403, Stop: 41735, Start Num: 15

Candidate Starts for SimranZ1\_64:

(Start: 15 @41403 has 2 MA's), (22, 41433), (23, 41442), (28, 41520), (29, 41544), (30, 41562), (37, 41616), (39, 41643), (45, 41673), (48, 41724),

Gene: Thibault\_75 Start: 51674, Stop: 52018, Start Num: 18

Candidate Starts for Thibault\_75:

(6, 51590), (Start: 18 @51674 has 24 MA's), (23, 51713), (28, 51785), (36, 51902), (44, 51944), (48, 52007),

Gene: ThreeRngTarjay\_88 Start: 57085, Stop: 57426, Start Num: 18

Candidate Starts for ThreeRngTarjay\_88:

(4, 56953), (9, 57013), (10, 57034), (11, 57040), (Start: 18 @57085 has 24 MA's), (23, 57124), (28, 57178), (42, 57340), (43, 57346), (46, 57373), (47, 57376), (48, 57415),

Gene: Velveteen\_58 Start: 37375, Stop: 37716, Start Num: 19

Candidate Starts for Velveteen\_58:

(Start: 16 @37366 has 1 MA's), (Start: 19 @37375 has 39 MA's), (23, 37414), (28, 37492), (48, 37705),

Gene: Wanda\_95 Start: 56202, Stop: 56543, Start Num: 18

Candidate Starts for Wanda\_95:

(4, 56070), (9, 56130), (10, 56151), (11, 56157), (Start: 18 @56202 has 24 MA's), (23, 56241), (28, 56295), (42, 56457), (43, 56463), (46, 56490), (47, 56493), (48, 56532),

Gene: Yeet\_84 Start: 55302, Stop: 55643, Start Num: 18

Candidate Starts for Yeet\_84:

(4, 55170), (9, 55230), (10, 55251), (11, 55257), (Start: 18 @55302 has 24 MA's), (23, 55341), (28, 55395), (42, 55557), (43, 55563), (46, 55590), (47, 55593), (48, 55632),

Gene: Yorick\_62 Start: 41335, Stop: 41676, Start Num: 19

Candidate Starts for Yorick\_62:

(Start: 16 @41326 has 1 MA's), (Start: 19 @41335 has 39 MA's), (23, 41374), (28, 41452), (48, 41665),

Gene: Zelink\_88 Start: 57397, Stop: 57738, Start Num: 18

Candidate Starts for Zelink\_88:

(4, 57265), (9, 57325), (10, 57346), (11, 57352), (Start: 18 @57397 has 24 MA's), (23, 57436), (28, 57490), (42, 57652), (43, 57658), (46, 57685), (47, 57688), (48, 57727),